What is claimed is:

1. An optical transmission system for amplifying a plurality of N input optical signals operating over a wavelength range of λ_1 - λ_N, the system comprising

a radio frequency (RF)-modulated pump source for providing an RF-modulated optical pump signal at a predetermined wavelength λ_P, the modulation frequency and depth being configured so as to increase pump power transferred from the pump to the plurality of N input optical signals whereby the cross talk between said plurality of N input optical signals is reduced; and

a transmission optical fiber coupled to receive said plurality of N input optical signals and to the RF-modulated pump source for utilizing the RF-modulated optical pump signal to generate optical amplification in said plurality of N input optical signals.

2. The transmission system as defined in claim 1 wherein the system further comprises

a wavelength division multiplexer for coupling the RF-modulated pump signal into the transmission fiber.

3. The optical transmission system as defined in claim 1 wherein the RF-modulated pump source comprises

an optical source for generating a continuous wave (CW) optical signal at the predetermined pump wavelength;

a signal generator for producing an electrical RF sinusoidal signal having the predetermined frequency and modulation depth; and

a modulator responsive to both the optical source and the signal generator for producing the RF-modulated optical pump signal.

4. The optical transmission system as defined in claim 3 wherein the modulator comprises an external modulator section integral with the optical source.

5. The optical transmission system as defined in claim 3 wherein the modulator comprises a discrete modulator component.

6. The optical transmission system as defined in claim 5 wherein the discrete modulator component comprises an electroabsorption modulator.

7. The optical transmission system as defined in claim 2 wherein the system utilizes a counter-propagating RF-modulated optical pump signal, with the wavelength division multiplexer disposed at the output end of the transmission fiber and the RF-modulated pump source coupled to said transmission fiber so as to propagate the RF-modulated optical pump signal in a direction opposite to that of the plurality of N input optical signals.

8. The optical transmission system as defined in claim 2 wherein the system utilizes a co-propagating RF-modulated optical pump signal, with the wavelength division multiplexer disposed at the input end of the transmission fiber and the RF-modulated pump source coupled to said transmission fiber so as to propagate the RF-modulated pump signal in the same direction as the plurality of N input optical signals.

9. The optical transmission system as defined in claim 1 wherein the plurality of N input optical signals operate over a wavelength range of approximately 1520nm – 1620nm.

10. The optical transmission system as defined in claim 9 wherein the RF-modulated optical pump signal comprises a predetermined wavelength of approximately 1440nm.

11. The optical transmission system as defined in claim 1 wherein the modulation frequency of the RF-modulated optical pump signal is a multiple of the rate of the plurality of N input data signals.

12. The optical transmission system as defined in claim 1 wherein the modulation frequency of the RF-modulated optical pump signal is a sub-multiple of the rate of the plurality of N input data signals.

13. The optical transmission system as defined in claim 1 wherein the modulation depth of the RF-modulated optical pump signal is maintained to be less than the extinction ratio of the input optical signals.

14. A method of increasing the pump power transferred between an optical pump source and optical information signals propagating through a transmission fiber, the method comprising the steps of:

providing a continuous wave (CW) optical pump signal at a predetermined wavelength;

modulating said CW optical pump signal with a radio frequency (RF) signal to produce an RF envelope on said optical pump signal; and

couple said RF-modulated optical pump signal into the transmission fiber with the optical information signals.

15. The method as defined in claim 14 wherein the modulation frequency and depth of the RF signal are configured to increase transferred pump power and reduce cross talk between the optical information signals.